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*Parekh, S.; Gandhi, N.; Hellerstein, J.; Tilbury, D.; Jayram, T.; Bigus, J.;*  
 Integrated Network Management Proceedings, 2001 IEEE/IFIP International Symposium on , 14-18 May 2001  
 Pages:841 - 854

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**2 Solomon: monitoring end-user service levels**

*Frolund, S.; Jain, M.; Pruyn, J.;*  
 Integrated Network Management, 1999. Distributed Management for the Networked Millennium. Proceedings of the Sixth IFIP/IEEE International Symposium on , 24-28 May 1999  
 Pages:261 - 274

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## Solomon: monitoring end-user service levels

 Frolund, S. Jain, M. Pruyne, J.  
 Hewlett-Packard Labs., Palo Alto, CA, USA;

*This paper appears in: Integrated Network Management, 1999. Distributed Management for the Networked Millennium. Proceedings of the Sixth International Symposium on*

Meeting Date: 05/24/1999 - 05/28/1999

Publication Date: 24-28 May 1999

Location: Boston, MA USA

On page(s): 261 - 274

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Number of Pages: xxvi+958

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### Abstract:

To manage distributed applications, we need to accurately monitor end-user service levels. There are two key challenges in monitoring end-user service levels: expressiveness and scalability. There is a big semantic gap between the metrics administrators want to monitor and the metrics offered by commercial measurement systems. Moreover, it is hard to apply the same kind of metrics to different applications because different applications are likely to offer different types of instrumentation. We want to apply the same metrics to very large numbers of instrumentation which makes scalability a key issue. In this work we present the activity monitoring language (AML) for declaratively specifying metrics, and a run-time system, called Solomon (**service level objective** monitor), that implements the concepts in Expressiveness is a result of AML, which allows the high-level specification of defined metrics in an application-neutral way. Solomon's scalability is a result of events and measurements as close to their physical source as is possible with accuracy.

### Index Terms:

computer network management formal specification monitoring quality of service specification languages AML Solomon activity monitoring language declarative specification distributed application management end-user service levels expressiveness high-level specification system scalability service level objective monitor user-defined metrics



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1 [Astrolabe: A robust and scalable technology for distributed system monitoring, management, and data mining](#)

Robbert Van Renesse, Kenneth P. Birman, Werner Vogels

May 2003 **ACM Transactions on Computer Systems (TOCS)**, Volume 21 Issue 2Full text available: [pdf\(341.62 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Scalable management and self-organizational capabilities are emerging as central requirements for a generation of large-scale, highly dynamic, distributed applications. We have developed an entirely new distributed information management system called Astrolabe. Astrolabe collects large-scale system state, permitting rapid updates and providing on-the-fly attribute aggregation. This latter capability permits an application to locate a resource, and also offers a scalable way to track sys ...

**Keywords:** Aggregation, epidemic protocols, failure detection, gossip, membership, publish-subscribe, scalability

2 [Session 10D: management of computation: Intelligent agents for QoS management](#)

Krunoslav Trzec, Darko Huljenic

July 2002 **Proceedings of the first international joint conference on Autonomous agents and multiagent systems: part 3**Full text available: [pdf\(281.59 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

This paper addresses the structural and behavioral characteristics of multi-agent system (MAS) for Quality of Service (QoS) management using MESSAGE (Methodology for Engineering Systems of Software Agents) modeling language that extends UML (Unified Modeling Language) by contributing agent knowledge level concepts and diagrams with notation for viewing them. Such a multi-agent system is an environment composed of Intelligent Agents (IAs) that ensure guaranteed QoS offered by multi-service commun ...

**Keywords:** MESSAGE/UML, QoS management, intelligent agents

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Thomas Kunz, Michiel F. H. Seuren

November 1997 **Proceedings of the 1997 conference of the Centre for Advanced Studies on Collaborative research**Full text available: [pdf\(4.21 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)



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 Bologna, Italy  
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 Pages: 1405 - 1412  
 Year of Publication: 2002  
 ISBN:1-58113-480-0

**Authors** [Krunoslav Trzec](#) Ericsson Nikola Tesla, Zagreb, Croatia  
[Darko Huljenic](#) Ericsson Nikola Tesla, Zagreb, Croatia

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### ↑ ABSTRACT

This paper addresses the structural and behavioral characteristics of multi-agent system (MAS) for Quality of Service (QoS) management using MESSAGE (Methodology for Engineering Systems of Software Agents) modeling language that extends UML (Unified Modeling Language) by contributing agent knowledge level concepts and diagrams with notation for viewing them. Such a multi-agent system is an environment composed of Intelligent Agents (IAs) that ensure guaranteed QoS offered by multi-service communication networks according to Service Level Agreements (SLAs) among users and service providers. A hybrid layered agent architecture that exploits both goal-orientation and reactivity is designed. It supports flexible and adaptive behavior as well as collaboration among the intelligent agents. It is shown that the applied multi-agent system for QoS management provides transformation of current communication networks toward a multi-service ubiquitous infrastructure with a unified QoS management architecture.

### ↑ REFERENCES

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## Managing service level agreements

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ISSN:1099-1190

Author **Nathan J. Muller**

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### ↑ ABSTRACT

Service level agreements are increasingly being used in enterprise networks and are contracts that specify the performance parameters within which a network service is provided. In this article their application, preparation, and effects on IT departments are considered. Copyright © 1999 John Wiley & Sons, Ltd.

### ↑ INDEX TERMS

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